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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/575,620   | 04/13/2006  | Shuso Iyoshi         | 2224-0257PUS1       | 3933             |
| 2292   | 7590        | 10/09/2008           | EXAMINER            |                  |
| BIRCH STEWART KOLASCH & BIRCH<br>PO BOX 747<br>FALLS CHURCH, VA 22040-0747 |             |                      |                     | NEGRELLI, KARA B |
| ART UNIT   |             | PAPER NUMBER         |                     |                  |
| 4131   |             |                      |                     |                  |
| NOTIFICATION DATE  |             |                      | DELIVERY MODE       |                  |
| 10/09/2008   |             |                      | ELECTRONIC          |                  |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

|                              |                        |                     |  |
|------------------------------|------------------------|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |  |
|                              | 10/575,620             | IYOSHI ET AL.       |  |
|                              | <b>Examiner</b>        | <b>Art Unit</b>     |  |
|                              | KARA NEGRELLI          | 4131                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 13 April 2006.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-3 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-3 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
     1. Certified copies of the priority documents have been received.  
     2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
     3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | Paper No(s)/Mail Date. _____ .                                    |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>04/13/2006</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application |
|   | 6) <input type="checkbox"/> Other: _____ .                        |



**PROCESS FOR PRODUCING POLYURETHANE FOAM**

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-3 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "ordinary" in claim 1 as it relates to temperature is a relative term which renders the claim indefinite. In line 8 of claim 1, a polyol component is described as being in the form of a liquid at an ordinary temperature. The term "ordinary" is not defined by the claim, the specification does not provide a standard for ascertaining the temperature at which the substance should be in the form of a liquid, as it only further describes such temperature as "room temperature," and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claims 2-3 are rejected for failing to correct the deficiency of claim 1.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rasshofer (US 2003/0104241 A1) and further in view of Mullins (US 3,592,877).

As to claim 1, Rasshoffer discloses a polyurethane resin produced by the reaction of a polyisocyanate component, a polyol component, an optional cross-linking agent, one or more catalysts, and water as a blowing agent (US 2003/0104241), paragraph [0033]). Rasshoffer further discloses that said polyol can be a polyester polyol obtained from lactones (paragraph [0040]) and that said polyol of which has an OH value of 100 to 500 mg KOH/g (paragraph [0047]). Rasshoffer fails to teach that the polyol is comprised of 30% by weight of a copolymerized lactone polyol obtained by copolymerization of  $\epsilon$ -caprolactone and  $\delta$ -valerolactone in a molar ratio of [ $\epsilon$ -caprolactone/ $\delta$ -valerolactone] of 80/20 to 20/80, and also fails to teach said polylactone polyol of which is a liquid at an ordinary temperature (column 2, lines 38-41). However, Mullins teaches linear polyesters made from lactones, in which the polyester charging ratio of  $\epsilon$ -caprolactone/ $\delta$ -valerolactone in weight percent is 80/20, 70/30, or 60/40, in which the  $\epsilon$ -caprolactone/ $\delta$ -valerolactone polyol comprised 45% of the total weight of the polyester for which it was made (column 14, Table II). Change et al (US 4,062,887) teach a polyurethane made from an organic polyisocyanate, a polylactone polyol, and a compound containing at least two active hydrogens per molecule, said polylactone polyol of which is a liquid at a room temperature 20°C to 30°C. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated a polyester made from a polyol in which said polyol compromises a lactone with a molar ratio of [ $\epsilon$ -caprolactone/ $\delta$ -valerolactone] of 80/20 to 20/80 because

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copolymerizing  $\epsilon$ -caprolactone with  $\delta$ -valerolactone results in a lactone with minimized or reduced crystallinity (Mullins (US 3,592,877), column 14, lines 10-25), further resulting in an article with more flexibility (Mullins (US 3,592,877), column 13, lines 11-25). It would have been obvious to use a polylactone that is liquid at an ordinary temperature because a liquid polylactone would be miscible with other reactants, such as organic polyisocyanates, which would enable all the reactants to be mixed at room temperature, a critical processing advantage (Change et al (US 4,062,887), column 2, lines 44-48).

As to claim 2, Rasshofer discloses polyester polyols for use in preparing a polyurethane resin, the process of which is described in the method as applied to claim 1 above, said polyester polyols of which are produced using polyols containing at least two hydrogen atoms which are reactive to isocyanate groups, including ethylene glycol, 1,2-propanediol, diethylene glycol, dipropylene glycol, 1,4-butanediol, glycerol, trimethylolpropane, and pentaerythriitol (paragraph [0039]).

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rasshofer (US 2003/0104241 A1) in view of Mullins (US 3,592,877) as applied to claim 1 above, and further in view of Chang et al (US 4,062,887).

Mullins teaches linear polyesters made from lactones, in which the polyester charging ratio of  $\epsilon$ -caprolactone/ $\delta$ -valerolactone in weight percent is 80/20, 70/30, or 60/40, in which the  $\epsilon$ -caprolactone/ $\delta$ -valerolactone polyol comprised 45% of the total weight of the polyester for which it was made (column 14, Table II). Mullins and Rasshofer fail to teach the process of producing a polyurethane foam according to claim

1 of the instant application wherein the viscosity of the copolymerized lactone polyol is not more than 20,000 mPa·s at 25°C. However, Chang et al teach polyurethanes made from an organic polyisocyanate, a polylactone polyol formed from ring opening a lactone have 6 to 8 carbon atoms with an organic polyhydroxyl compound, and a compound containing at least two active hydrogens per molecule reactive with isocyanate groups, said lactone of which is a liquid at a temperature between 20°C and 30°C, or said lactone of which is a low melting solid. The lactone described by Chang et al would inherently have a viscosity comparable to that specified in claim 3 of the instant application. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a copolymerized lactone polyol with a viscosity lower than 20,000 mPa·s because the liquid polylactone would be miscible with other reactants, including organic polyisocyanates, allowing for the components to be mixed at room temperature (Chang et al (US 4,062,887), column 2, lines 38-48).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KARA NEGRELLI whose telephone number is (571)270-7338. The examiner can normally be reached on Monday through Friday 7:30 am EST to 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Sample can be reached on (571)272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David R. Sample/  
Supervisory Patent Examiner  
Art Unit 4131

/KARA NEGRELLI/  
Examiner, Art Unit 4131